COLLECTING IN TURKEY
1959, 1960 & 1962

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CONTENTS

SYNOPSIS

The paper includes information essential to the elucidation of localities and ecology to be published in taxonomic works on insects collected on the expeditions of the authors to Turkey in 1959, 1960 and 1962.

INTRODUCTION & NOTES ON THE TURKISH LOCALITIES

During 1959, 1960 and 1962 three entomological collecting expeditions were made to Turkey to acquire specimens for the British Museum (Natural History). The first of these was undertaken by one of us (K.M.G.) alone between 19th March and 29th September and which, without his own transport, was more in the nature of a reconnaissance. In 1960 between 22nd April and 25th October a second expedition, this time with transport of a sort and with the help of a grant from Shell Petroleum Company, was made by both writers. The third expedition, also with Harvey, took place in 1962 from 7th March to 31st August and an essential Land Rover was taken. This last visit was marred by unexpected restrictions placed on our movements and we finally left Turkish soil on 12th August and then made from 15th to 20th August a visit to the island of Samothrace (Samothraki).

During the whole time we were in Turkey the utmost help was given to us by the Turkish Department of Agriculture and by Ankara University and both not only provided some local transport but the former also placed at our disposal for a time two of its experts, Mr. Huseyin Belet and Mr. Kemal Kunter and their great kindness, advice and assistance proved invaluable. The Turkish Shell Company in İstanbul and Ankara also provided us with various facilities and showed much kindness. Miss Betsy Allen who was then at the British Embassy took a load from our minds by the careful conveyance of a large part of our collections to London and we thank her also for many fruitful excursions around Ankara. We are also most grateful to the British School of Archaeology at Ankara for granting us membership and the privilege of excellent accommodation on the edge of a good collecting area that has now probably gone forever. We are indebted to Dr. L. G. Higgins and Dr. E. J. Popham, editor of the " The Entomologist " for allowing us to reproduce the map accompanying this paper (p. 248).

The main purpose of these three expeditions was to collect Hymenoptera and Orthoptera but a large number of Diptera and Rhopalocera was also taken as well as Hemiptera and Coleoptera. A collection of Odonata was made by one of us (K.M.G.) and deposited with the Edinburgh Museum which also received some Hemiptera Homoptera and duplicate Orthoptera and Rhopalocera. Manchester Museum received a considerable number of Coleoptera, especially Chrysomelidae. Besides insects, several hundred plant gatherings were deposited at Kew (1959 and 1960) and at Edinburgh (1962). Reptiles, mainly lizards, were acquired by the British Museum of Natural History and they included series of two species of *Mertensiella*. Bird notes from the three expeditions were sent to the Edward Grey Institute of Field Ornithology at Oxford.

The part of Turkey more specially chosen for investigation was the high hinterland of the Black Sea Coast east of Samsun which includes the Pontic Mountains. Here, it was hoped to establish a connection with the fauna of the Caucasus and to determine the western limits of the Caucasian elements. It appears that the material gathered from that area promises to fulfil these expectations.

Travel in large parts of Turkey is still forbidden and to this may be attributed the absence of specimens from much of eastern and southern Turkey. Nevertheless, we were grateful for the permission granted to us to visit the Mount Ararat area during 1960, when we collected near to the Russian frontier and took samples of insects equally Russian in their distribution.

TOPOGRAPHY AND CLIMATE

Asiatic Turkey is a plateau roughly 1,600 kilometres long by 640 across with an average height of 850 metres. Its uniformity is relieved by isolated mountains, by the country becoming higher in the east, and by the slight salt lake depression of Tuz Gölü near the centre. On the north, the plateau is rimmed by the Pontic Mountains which are divided by deep valleys. The southern rim of the plateau is formed by the Taurus Mountains which, in the four highest ranges east of Silifke, rise to 4,000 metres (Ala Dağ). In western Turkey the highlands run out into the Aegean as mountainous fingers but between these ranges the rivers coming down from the plateau have formed broad deltas. In the extreme east of the country the topography becomes confused and the mountain mass known as the Armenian Knot merges into the Pontic ranges and eastwards into the Zagros across the Iran border. Coastal plains of any size in Turkey are few, the largest being the Cilician Plain bordering the north-east corner of the Mediterranean.

Even within its six main geographical divisions, the Turkish climate is very varied due to changing altitude and the dissected nature of the country.

(1) The Black Sea Coastlands are considered to be about 130 km. in depth and commence at İzmit in the west with the border running eastwards through Çankırı, Amasya, the watershed of the Kelkit River and the south watershed of the Çoruh up to the Russian frontier at Çıldır, and form a well defined, mostly wet climatic zone. North winds prevail at all seasons. The winters are mild (c. 7° C.) near the coast but temperatures fall inland with elevation. The summers are fairly hot (23° C.)

especially in the west which is also drier. Sinop marks that part of a coastal zone west of which the olive does not grow. East of Samsun the climate is decidedly damp throughout the year with rain heaviest in winter. Between Giresun and the Russian frontier lies the wettest part of Turkey with frequent mist and cloud both on the coast and on the north facing slopes of the heavily forested Pontic ranges which in this sector are most impressive, rising to over 3,300 metres. Near the coast at lower altitudes tea is grown extensively and at Rize the rainfall reaches 2,540 mm. and the hinterland is not unlike parts of Ceylon in appearance, especially in the richness of the greens. Even in summer the rain can for several consecutive days inhibit insect collecting.

(2) In western Turkey the coastal regions in winter are damp, cloudy and mild (7° C.) but with occasional frost. The summers are hot (27° C.), dry and sunny—more typical of the Mediterranean type of climate.

(3) The southern Turkish coastlands bordering the Mediterranean are in winter warmer (10° C.) and the summers are very hot and dry with little cloud. The predominantly winter rainfall reaches 1,040 mm. in the west, diminishing to 580 mm. in the east. The Cilician Plain, the centre of cotton growing, has its own summer climate of exceptional and unpleasant humidity which was experienced by us at Adana.

(4) The great and largely unforested central plateau between Longitude 30° and 38° has prevailing northerly winds and cold winters (—1° C.) with hard frosts and snow (20–35 snow days a year). As an indication of the severe climate at 1,000 metres, around Ankara hardly any insect life and only a few crocuses appear by the end of March. The summers are dry and dusty and fairly hot (c. 23° C.) and June coincides with the maximum appearance of insects. September on the plateau has little to offer the entomologist except Orthoptera. The rainfall is light (250–430 mm.) and falls mainly as heavy showers in May and November. Towards the east the summers are cooler in the north and hotter in the south and the winters are colder (—7° to— 1° C.).

(5) Facing Syria, south-east Turkey, which we did not visit as it was out of bounds, has a mild winter (4° C.) near the border, but is colder further inland (Diyarbekır —1° C.). The summers are very hot, cloudless and dry with occasional sirocco winds from the south and dust storms. The rainfall mostly in winter averages 430 mm. and there are violent storms in spring and early summer.

(6) The last region of eastern Turkey bordering the great land mass of Asia has a varied climate according to topography. Winds are from the north and east and the winters are severe, to —12° C. in the north with an absolute minimum of —40°. Summers are hot to c. 27° C. in the south. Rainfall, mostly in spring and winter, reaches 500 mm. on the plains but is heavier on northern mountain slopes. The snow can lie for about seven months in the year and permanently on the high mountains. This region south-west of Mount Ararat we did not visit.

There remains to mention Thrace or the small European part of Turkey which, excluding the Gallipoli Peninsula, is nowhere more than 160 km. from north to south or broader than 240 km. from west to east. It is mainly a slightly undulating wheat growing area which is traversed by the road from Edirne to İstanbul. The winters

are mild and humid near the coast (c. 4° C.) and the summers fairly hot (24° C.). A moderate rainfall decreases inland (730–560 mm.). However, in the south, Tekirdağ and the Gallipoli Peninsula remain elevated and there are also hilly districts up to 1,000 metres in the north towards the Bulgarian frontier. Their exploration is for those who can abide the tedium of moving about in military zones, the exact limits of which are difficult to ascertain.

REMARKS

Much of the Turkish insect fauna is still imperfectly known despite the increased amount of collecting in recent years and there are still certainly discoveries to be made even amongst the Lepidoptera Rhopalocera which a present estimate (L. Higgins, 1966) reveals as 268 species. Turkish ecological habitats are not only extremely varied but their locations are widely separated so that even a single season of six months' collecting can give only a slight idea of the country's total fauna. Very large areas, especially on the plateau, can prove unrewarding and one can drive for a whole day in this region without finding an area one would wish to examine for more than a single hour. But it seems also true that any natural habitat that has not suffered too much from the attentions of predatory goats is likely to reveal at least something not found before and over the whole country the total number of these habitats is very large indeed. There are no comparatively restricted best areas for collecting in Turkey like there are for instance in Britain where the old classic localities still retain their importance. It seems one must go practically everywhere, into every Turkish province, to obtain a complete picture. But one could probably say that north-west Turkey, the Mediterranean coast and the central plateau (high mountains excepted) have least to offer and that the Pontic mountains as a whole contain the richest fauna, while at present, most of central, east and south-east Turkey east of the Euphrates awaits investigation.

In terms of altitude there is very little to be found above 2,600 m. and peculiar and rare species on mountains seem mostly to be at the lower altitudes at around 1,600 m.

A certain draw for all kinds of Hymenoptera and many Diptera are umbellifers (particularly yellow ones) in flower and their presence even in less interesting areas is always a guarantee of something. But sweeping, by British standards, even in the most promising localities can often be, and usually is, extremely disappointing. While an average English wood can produce as many as a thousand specimens of Hymenoptera Parasitica in a single day's sweeping, a comparable Turkish locality, say in the Pontic mountains in glades on the Zigana, produces only 40–50 specimens although the number of species may be considerable when worked out—that remains to be seen. Our best day's collecting for numbers was only 1,200 specimens to two nets, but this was at yellow umbellifers on the plateau at 900 metres altitude. We felt, even on the Zigana, with easily accessible localities at varying altitudes from 1,600–2,600 m., that after five full days' collecting it was time to move on and very few localities seemed to justify a stay of more than two days. These impressions of course would hardly apply to intensive collecting of Coleoptera which was not our aim.

LIST OF TURKISH LOCALITIES 1959–62 WITH NOTES

The name of the province in capital letters (see Turkish map 'Harita Genel Müdürlüğü—1960. 1 : 1,200,000) and the name of the locality with altitude (if in feet, altered to metres) and date are here set out to correspond with the British Museum printed labels on the specimens and any errors on these labels are now corrected. The number in [ ] following each provincial name refers to the map on p. 248 of this paper. S.L. = roughly sea level.

ADANA [31]

1. Çalıdağı, 27.v.1960, 100 m. *or* Seyhan, nr. Adana, Çalıdağı. Refers to 12 km. east of Adana on the plain. Collected in three adjoining localities: (1) Flowery ditch running through cotton fields, (2) Flat rocky ground impossible to cultivate with sparse vegetation and (3) Slow stream with lush fringing vegetation, mostly Odonata.
2. Seyhan, Misis, 50 m., 10.vi.1960. Eroded waste land and gullies at foot of low hills.
3. Karataş, 7.vi.1960. S.L.
4. Karataş, 8.vi.1960. S.L.

Sand dunes near shore but most specimens from wild carrot (*Daucus*) swarming with Hymenoptera along damp depression running inland for 300 metres between fields.

5. Osmaniye area, 19.vi.1960, 100 m., 20.vi.1960. At yellow umbellifers in and bordering cereal cultivations. In evening also collected roosting Hymenoptera on plant stems in Osmaniye cemetery.
6. Amanus Mts., Nurdağı Geçidi, 18.vi.1960 and 19.vi.1960, 1,150 m. Rocky hillside with low *Quercus*.
7. Adana, 20.vi.1960.

AMASYA [40]

1. Amasya, 400 m., 29 & 30.v.1959.
2. Amasya, 500 m., 31.v.1959.
3. Amasya, 500 m., 1–2.vi.1959.
4. Amasya, 500 m., 4.vi.1959.
5. Amasya, 500 m., 6.vi.1959.
6. Amasya, 500 m., 9.vi.1959.
7. Amasya, 500 m., 22–24.vi.1959. (Label should read 22–24.v.1959.)
8. Amasya, 800 m., 17.vii.1959 and 18.vii.1959.
9. Amasya, 500 m., 11.v.1962.

The chief collecting area at Amasya was up Çakalla behind the town where a stony track ascends steeply through cherry orchards to meet a rough vehicle road higher up. Beyond this junction and under the cliffs of an escarpment there is thick *Quercus* and *Carpinus* scrub interspersed with flowery glades. The most prolific time for insects during 1959 was the last week in May and the first in June. On 17th July there was little on the wing. Several excursions were made along the banks of the

Yeşil Irmak which although sandy did not provide many insects nor did the orchards, gardens and walnut groves bordering the river. In early June there were still plenty of flowers on the rocky hills beside the road leading to Samsun but Çakalla was still the best locality and also one of the richest found in Turkey. In the past, Amasya has been explored by German entomologists chiefly for Lepidoptera. Its potentialities during April were not observed.

10. 25 km. Amasya–Meçitözü Rd., 1,000 m., 1.vii.1960 (correct to 1.viii.1960).

11. 30 km. and 35 km. Amasya–Meçitözü Rd., 1,000 m., 1.viii.1960. Specimens from *Daucus* flowers bordering ditches through cultivations on the plain.

12. Göynucek, 500 m., 8.vi.1959. Patches of oak scrub on stony ground left between green cereal cultivations and on plentiful flowers.

13. Merzifon area, 1,000 m., 3.vi.1959. Sweeping *Quercus* scrub on eroded hillsides near the rough road leading to Tavsan Dağı.

14. Sırıklı, 600 m., (Nr. Merzifon), 20.v.1959.

15. Sırıklı, 800 m., nr. Merzifon, 21.vii.1959. Above junction of roads leading to Amasya and Samsun. Typical plateau with cereal cultivations and eroded gullies on hillsides.

16. Suluca, 18.vii.1959, 700 m. East of the sugar factory on Amasya road. Typical open plateau with sugar beet fields and low heavily grazed hills nearby.

17. Tavsan Dağı, 20.vii.1959, 1,700 m. A considerable elevated area north of Merzifon. Low forests of *Fagus* and *Quercus* and also *Pinus*. Damp flowery meadows swarming with butterflies (50 spp.). A good area difficult of access and the highest part was not reached.

18. Tavsan Dağı, 3.vi.1959, 1,700 m. (Label should read 1,000 m.). See Loc. 13.

ANKARA [27]

1. Ankara, 1,000 m., 30.vi.–5.vii.1959.
2. Ankara Area, 1,000–1,300 m., 20–30.vi.1959.
3. Ankara, 1,000 m., 26.vi.1959. (From Kavaklıdere).
4. Ankara, 1,000 m., 27.vi.1959. (From suburb of Etlik).
5. Ankara, 1,000 m., 29.vi.1959. (From Kavaklıdere).
6. Ankara, 1,000 m., 2.vii.1959. (From Kavaklıdere).
7. Ankara, 1,000 m., 5.vii.1959. (From Dikmen).
8. Ankara Area, c. 1,000 m., 26.vi.1960.

The area around Ankara is probably one of the richest in the central Anatolian plateau. But as the capital extends it can confidently be predicted that all the agreeable little valleys and waste places in the suburbs of Kavaklıdere, Çankırı and Etlik will be swallowed up by houses. The enormous growth of buildings and the pressure of other human activities has even within the last four years made a great difference in collecting areas which in 1959 produced a wealth of insects. In 1962 the diminished extent of these collecting grounds and the overgrazing in others was very marked. The top and sides of Dikmen had not changed much but on the road to Elma Dağı areas of natural steppe observed formerly had fallen under the plough.

Such changes are inevitable and the relatively large amount of time spent in collecting around Ankara should become historically interesting to future students who will have to go much further afield to find traces of the original insect fauna. However, within an hour's drive of the capital there are still some varied and inviting insect localities : Beynam with a few well watered and sheltered valleys, Elma Dağı still relatively unspoilt, and Hasanoğlan with its flowery marshes teeming with insects in late May and June which is the best time for all these areas. For the bulk of the Orthoptera August and September are best.

9. Ayaş Dağı, 1,300 m., 30.vi.1959.

10. Ayaş Dağı, 1,300 m., 12.vii.1959.

Collected on bare overgrazed limestone hills above the highest point where the old road from Ankara to İstanbul crosses a shoulder of this mountain. Tabanids were a source of annoyance on the first date.

11. Beypazarı (or Baypazarı), 17.v.1960. 700 m. Low hills and gullies on open plateau steppe.

12. Beynam, 1,000 m., 26.vi.1962.

13. Beynam, 1,000 m., 6.v.1962.

13a. Beynam, 13.ix.1959.

Beynam Forest is a slightly elevated relict conifer area 30 km. south of Ankara. The lower northern slopes are penetrated by several well watered valleys with attractive streams fringed with a dense and varied shrub vegetation.

14. Çubuk, 21.v.1960. 800 m.

15. Nr. Çubuk, 22.v.1960, 800 m.

Round the flowery and marshy edges of a lake formed by a dam 25 km. north of Ankara (not Çubuk Baraji).

16. Çubuk–Karagol Road, c. 1,300 m., 16–17.viii.1960. Isolated bare limestone hill half-way between Çubuk and Karagol Lake.

17. (Dikmen), 1,000 m., 5.vii.1959.

18. (Dikmen), 1,000 m., 7.vii.1959.

19. Dikmen, 17.viii.1960, 1,000 m.

20. Dikmen, 12.viii.1960, 1,000 m.

Rocky top and half-cultivated orchard-covered sides of the hill Dikmen on the southern outskirts of Ankara and by small cereal cultivations edged with flowers on the summit.

21. Elma Dağı, 1,700 m., (Nr. Ankara), 28.vi.1959.

22. Elma Dağı, 1,800 m., 8.ix.1959 or 7–12.ix.1959 (correct to " 8 and 12. ix.1959 ").

23. Elma Dağı, 1,800 m., 21.v.1960.

24. Elma Dağı, 22.v.1960, 6,000′. (Label should read 21.v. & 1,850 m.).

25. Elma Dağı, 17.viii.1960, 6,000′. (Label should read 1,850 m.).

26. Elma Dağı, c. 6,000′, 18.viii.1960. (Label should read 1,850 m. & 17.viii. 1960).

27. Elma Dağı, c. 1,000 m., 5.v.1962. (Low foothills).

28. Elma Dağı, c. 1,000 m., 19.vi.1962. (Low foothills).

29. Elma Dağı, c. 1,500 m., 19.vi.1962.

30. Elma Dağı, c. 1,000 m., 27.vi.1962. (Standing corn in foothills).
31. Elma Dağı, c. 1,000 m., 28.vi.1962. (Standing corn in foothills).

A bare treeless mountain (1,855 m.) north-east of Ankara from which a road leads to the top which is fairly flat and covered with short turf. The foothills where a little steppe vegetation still persists are good in May and June. Many Hymenoptera roost at sundown on the stems of standing corn in these foothills and this applies generally to the whole of the Anatolian plateau and the same habit was observed in European Turkey. Even on a fine day which suddenly clouds over—the prelude to a storm—large numbers of different bees and wasps and even Diptera and Odonata and especially Ascalaphids can be easily taken in a torpid condition. Indeed, some genera such as *Sphex* and *Ammophila* form communal roosting groups.

32. Above Hasanoğlan, 29.vi.1962, 1,500 m. Bare hill slopes to the north of the village that become the foothills of İdris Dağı.
33. Hassan Oğlan, 1,000 m., 8.vii.1959.
34. Hassan Oğlan, 900 m., 6.ix.1959.
35. Hasan Oğlan, 29.vi.1960, 900 m.
36. Hasanoğlan, 900 m., 29.vi.1962. Hasanoğlan 20 km. east of Ankara. Marsh and lush meadows full of flowers close to the road, swarming with insects in June.
37. İdris Dağı, 30.vi.1962, c. 1,300 m. Treeless mountain east of Ankara with a few patches of *Quercus* scrub. Most Hymenoptera caught on *Euphorbia* and exploring leaves of *Rosa* and foliage of old pear tree.
38. Kalecık area, c. 900 m., 7.viii.1960. Collected along the banks of the River Kızılırmak: *Tamarix* scrub, sandy patches and small stony wadis with sparse vegetation.
39. Karagol Lake, 26.vi.1960, 1,200 m.
40. Karagol Lake, 16.viii.1960, c. 1,300 m.
41. Karagol, 1,200 m., 22.vi.1962.

Small deep isolated crater lake 50 km. north of Ankara mostly fringed with dense mixed woodland set in rugged hills.

42. Kavaklıdere, 1,000 m., 26.vi.1959.
43. Kavaklıdere, 950 m., 9.x.1959. (Should probably read i.ix.1959).
44. Kavaklıdere, 950 m., 21.v.1960.
45. Kavaklıdere, 25.vi.1960, 950 m.
46. Kavaklıdere, 6.viii.1960, 900 m.
47. Kavaklıdere, 8.viii.1960, 900 m.
48. Kavaklıdere, 11.viii.1960, 1,000 m.
49. Kavaklıdere, 12.viii.1960, 900 m.
50. Kavaklıdere, 28.ix.1960, 1,000 m.
51. Kavaklıdere, 900 m., 21.vi.1962.
52. Kavaklıdere, 900 m., 25.vi.1962.

Kavaklıdere is a southern suburb of Ankara. Collecting was carried out in waste places between vineyards and haphazard cultivations along the small valleys behind and within a mile of the British Archaeological Institute in Tahran Caddesi. It is unlikely that in another five years any of these localities will exist as collecting

areas. Specimens from Nos. 46 & 47 were taken at aphid " dew " on peach leaves in the front garden of the British Archaeological Institute.

52a. Kecicoren, 9 or 10.vii.1959. (Correct to Keçiören).

53. Kırıkkale, 16 km. W. of, 29.vi.1960, 900 m.

54. 13 km. W. of Kirikdale (should read Kırıkkale), c. 900 m., 30.vi.1960. One lot of labels with altitude omitted. Specimens swept from the yellow flowers of a species of *Opoponax* (Umbelliferae) growing in wheat fields bordering a tributary of the Kızılırmak. Hymenoptera in the greatest numbers ever seen at flowers.

55. Kızılcahamam, 30.iii.1959, 1,000 m. By small stream with earliest spring flowers in conifer woods.

56. Nallıhan, 30.vi.1959, c. 700 m. Unproductive agricultural experimental gardens.

57. Polatli, 800 m., 2.v.1962. Edges of salt pan on open plain.

58. Ravli, 1,000 m., 30.vi.1962. 16 km. NE of Ankara on Kalecîk Rd. Specimens knocked into the cyanide bottle while roosting on corn stalks just prior to a late afternoon thunderstorm.

59. 20 km. N. of Şereflikoçhisar, 24.vi.1962, 900 m. Sweeping yellow umbellifers beside the road.

60. Temelli, C. 800 m., 27.vii.1962. A lush and grassy depression on the plain filled with flowering *Ononis* (Leguminoseae).

61. NE Tuz Gölü, 900 m., 31.viii.1959.

62. Tuz Gölü, (E side, 900 m.), 1.ix.1959.

63. Tuz Gölü E side, 24.v.1960 (alt. omitted = 900 m.).

64. Tuz Gölü E side, 900 m., 29.ix.1960.

Edges of the vast and mostly dry (in summer) salt lake south of Ankara. Some areas with grass and rushes bordering cereal cultivations and No. 61 with adjacent dry stony hills.

65. 39 km. E of Kilikdale. (Correct to " Kırıkkale "). Yenihan, 1.vii.1960. (Add " c. 800 m. ").

ANTAKYA see HATAY [30]

ANTALYA [19]

1. Akseki, 1,500 m., 1.iv.1962. This refers to the Irmasan Geçidi (1,525 m.) where Hymenoptera were taken at flowers of *Eranthis cilicica* and *Crocus nubigena* at the edge of melting snow in a depression in conifer woods.

2. Akseki, 1,000 m., 1.iv.1962.

3. Antalya, S.L., 3.iv.1962.

4. Antalya, S.L., 5.iv.1962.

Mostly sweeping coastal marsh and dykes with *Iris pseudacorus*.

5. Aspendos, 50 m., 4.iv.1962. Most specimens from a small flowery overgrown cemetery by the roadside approaching the ruins.

6. Finike, 50–100 m., 7.iv.1962.

7. Finike, 75 m., 9.iv.1962. From flowers along edges of wheat fields and along rocky valley a few km. behind the village.

8. Finike, 8.iv.1962, S.L. Large cemetery filled with spring flowers at Çavdîr.

9. Finike, marsh S.L., 8.iv.1962. Sweeping coastal marshes near the village.

10. Finike–Kaş Rd., 300 m., 10.iv.1962. Flowery glades between small cereal cultivations bordering thick *Quercus* scrub with some larger trees.

11. 30 km. Kaş–Elmalı Rd., 1,700 m., 11.iv.1962. Several points on road through conifer forest (including *Cedrus*). Large numbers of Andrenas at flowering isolated tree of *Prunus insititia*.

12. 30 km. Kalkan–Elmalı Rd., 1,600 m., 11.iv.1962. Clearings in conifer forest—short turf and Euphorbias.

13. Kalkan–Kestep Rd., 150 m., 12.iv.1962. *Quercus* parkland with small cereal fields and flowers.

14. Manavgat, S.L., 2.iv.1962. In Roman ruins of Side near the sea ; sandy soil with plenty of spring flowers. Also Odonata from near the falls above the village.

ARTVİN [58]

1. Above Artvin, 17.ix.1960, 1,700 m.

2. Above Artvin, 700 m., 5.vi.1962.

3. Above Artvin, 900 m., 6.vi.1962.

4. Above Artvin, 1,800 m., 6.vi.1962.

Collecting at Artvin was above the town where a zigzag jeep track ascends via Genye (No. 2) through a mixed forest of conifers, rhododendrons and various shrubs (*Viburnum*, *Euonymus*, etc.) (No. 3) up to pure conifer and *Fagus* woods that are interspersed with glades of short turf. At the highest levels there is much open downland. In June, 1962 the rainfall was heavy but on the 6th one cloudless day was spent partly on a hillside of white rhododendrons near the 1,700 m. level and partly on the lush flowery edges of a spruce forest lower down and bordering some damp alpine meadows of long grass. Dead and fallen trees attracted wood haunting Hymenoptera and certain Asilidae. Very few butterflies were seen above Artvin.

5. Artvin, Berta, 16.ix.1960, 1,200 m. Some 25 km. NE of Artvin, a timber reception area near the head of a much eroded valley below the conifer zone.

6. Yusufeli, 600 m., 7.vi.1962. Stony hillsides above small river valley and deserted cultivations near river.

7. 20 km. Yusufeli–Tortum Rd., 8.vi.1962, 700 m. Sandy waste ground at foot of stony hills in river valley. Cicadas just hatched and swarming.

AYDIN [15]

1. Bozdoğan, 200 m., 22.iv.1962.

2. Bozdoğan, 200 m., 23.iv.1962. Orchard waste ground and cemetery with spring flowers.

BİLECİK [10]

1. Bilecik, 500 m., 1.v.1962. Mostly sweeping *Quercus* scrub on eroded hillside with *Pinus*.

2. Osmaneli, 170 m., 1.v.1962. As No. 1.

BOLU [23]

1. Ala Dağı, 2,000 m., Kartal Kaya Tepe, 15.vii.1962.

This mountain SE of Bolu can just be approached by Land Rover. The solitary outcrop of Kartal Kaya Tepe is covered with thick tufted grass and scattered pines at its foot. Lower slopes of the mountain have lush bogs thick with *Rumex* and *Polygonum* which merge into dense conifer forest where bears are said still to exist.

2. Göynük, 17.v.1960, 700 m.

3. Lake Abant, 1,000 m., 13.vii.1962.

4. Lake Abant, 1,000 m., 14.vii.1962. Marshy glades in pine woods near the lake. Considerable marsh at west end of lake. Glades in spruce forest. The heights above the lake are heavily overgrazed and were quite unproductive. The flora and insect fauna of the Abant area is distinctly European, viz. the orchid *Epipactis palustris* and the grasshopper, *Mecostethus grossus*, found for the first time in Turkey.

BURSA [7]

1. Bursa Area, 50 m., 30.iv.1962. These labels refer to Karacabey cemetery and for Coleoptera to the very dull north shore of Lake Apolyont which is said to be a bird sanctuary although no birds were seen.

2. Bursa–Mudanya Rd., 50 m., 28.iv.1962. Waste ground with spring flowers on northern outskirts of Bursa.

3. İznik (Mezarlik), 50 m., 1.v.1962. Overgrown cemetery outside the walls of Iznik.

4. Karacabey, 80 m., 29.iv.1962.

5. Karacabey, 80 m., 30.iv.1962.

6. Karacabey, 80 m., 3.viii.1962.

The cemetery was the only collecting ground at Karacabey. In Turkey all cemeteries are worth visiting as goats are not allowed in and these places are overgrown, full of flowers and fairly private. Snakes abound.

7. 10 km. S of Karacabey, 3.viii.1962, 70 m. (& 4–5.viii).

Refers to the government farm known as Karacabey Harası where there are some ungrazed areas of long grass and *Ulmus* thickets with patches of light *Quercus* woodland.

8. Orhangazi, 150 m., 9.viii.1962. Dense patches of *Quercus suber* woodland.

9. Uludağ, 500 m., 26.iv.1962.

10. Uludağ, 1,500 m., 27.iv.1962.

11. Uludağ, 2,300 m., 6.viii.1962.

12. Uludağ, 1,500 m., 7.viii.1962.

13. Uludağ, 2,000 m., 7.viii.1962.

14. Uludağ, 500 m., 8.viii.1962.

This large isolated mountain (4,200 m.) near Bursa is a classic collecting locality mainly because its heights are easily accessible to vehicles. On the whole we found it rather disappointing. The end of April was much too early for the upper part of the mountain which was still under snow well below the winter sports area. Nos. 9 and 14 refer to the sheltered patches of woodland mixed with small orchards that

were filled with spring flowers. No. 11 refers to the last 400 metres of Uludağ, stony barren and treeless. No. 13 was mostly collecting at *Mentha* flowers by a small stream near the sanatorium.

ÇANKIRI [26]

1. Çankırı, 726 m., 23.vii.1962. Dry limestone *Artemisia* steppe with adjacent fields of standing corn with roosting Hymenoptera at dusk.
2. 24 km. S of Çankırı, 24.vii.1962, 803 m. Waste ground by the road on open plateau and Diptera in damp ditch.
3. 15 km. Ilgaz–Çankırı Rd., 23.vii.1962, 1,400 m. Mostly Bombus visiting *Astragalus* on rocky plateau.
4. Ilgaz Dağı, 22.vii.1962. See under KASTAMONU.
5. Ilgaz (village), 900 m., 21.vii.1962.
6. Ilgaz (village), 900 m., 22.vii.1962. Roosting Hymenoptera on standing corn at evening.

ÇORUM [39]

1. Boğazkale, 2.viii.1960. (Add c. 1,000 m.). Hittite ruins: eroded and overgrazed plateau.
2. İskilip, 700 m., 9.v.1962. Stony stream bed with many flowers. Sweeping *Ulmus* and *Populus*.

EDİRNE [1]

1. Edirne, 6.v.1960, 15 m. Natural park with deciduous trees and undergrowth on outskirts of town not far from Customs barrier.
2. Keşan area, 125 m., 6.vii.1962. Overgrown cemetery with dense *Quercus* scrub, *Rubus* and long grass.

ERZİNCAN [54]

1. Refahiye–Erzincan (add Rd.), 10.vii.1960, 1,000 m.
2. Refahiye, c. 1,150 m., 10.vii.1960.
3. Erzincan, 1,500 m., 11.vii.1960.

Typical stonier parts of plateau country.

ERZURUM [59]

1. Azort, 2,250 m., 10.vi.1962. Edges of corn fields with flowers.
2. Erzurum, 1,950 m., 10.vi.1962. Sweeping dyke on plain outside town.
3. İspir, 1,140 m., 30.v.1962. Lush patches of meadow on hillside near village.
4. İspir, 1,299 m., 31.v.1962. Stony hillsides with *Euphorbia* along valley of Çoruh River.
5. 20 km. (change to 14–20 km.) İspir–İkizdere Rd., 1.vi.1962, 1,700 m. (change to 1,400–1,700 m.).
6. 20 km. (change to 14–20 km.) İspir–İkizdere Rd., 2.vi.1962, 1,700 m. (change to 1,400–1,700 m.).

All *Bombus* bearing these labels were collected at 1,700 m. at small *Astragalus* flowers growing in the short turf some 350 m. below the melting snows. Other insects are referred to a steep hillside of mostly low dense vegetation including *Quercus* and yellow umbellifers at about the 1,400 m. level where the rushing stream descends to join the Çoruh River through a valley-gorge. Diptera and *Dolerus* sawflies were also swept from a marshy meadow at about 1,550 m.

7. 25 km. İspir–İkizdere Rd., 1.vi.1962, 2,000 m. Highest point on the pass along this road. Mostly Coleoptera crawling on short turf within a few feet of melting snow and ice of streamlets.

8. Kandilli, 1,900 m., 11.vi.1962. Typical high plateau.

9. Kopdağı Geçidi, 21.vii.1960, c. 2,300 m.

10. Kopdağı Geçidi, 22.vii.1960, c. 2,300 m.

11. Kopdağı Geçidi, 23.vii.1960, c. 2,300 m.

12. Kopdağı Geçidi, 29.v.1962, 2,390 m.

The Kopdağı Geçidi is a high pass SE of Bayburt running over a shoulder of the Kop Dağı (2,953 m.), a range south of the Çoruh valley and much drier than the Soğanlı Dağları to the north that catches most of the rain coming from the Black Sea. The top of the pass is dry and stony with in places short turf dotted with stunted *Juniperus* but a little lower on the north side there are lush meadows with *Primula pallasii*.

13. Ovacık, 2,000 m., 30.v.1962. Marsh in valley near trout stream.

14. Tortum, 1,550 m., 10.vi.1962. Typical cultivated plateau. Fallow field with masses of red labiate attracting *Bombus*.

ESKİŞEHİR [22]

1. Kaymaz, 800 m., 27.vii.1962. Sweeping white umbellifers bordering cultivations on the plain.

GİRESUN [45]

1. Armelit, 16.iv.1959, c. 700 m. Highest point on Giresun–Trabzon Rd.

2. Balaban Dağları, 9.vii.1960, 1,600 m.

3. Balaban Dağları, 9.vii.1960, 1,733 m. (correct to 2,075 m.).

These refer to the pass of Eğribel on the Şebinkarahisar–Giresun Rd. The open turf downland near the top of the pass where patches of melting snow lingered a little higher in early July revealed few insects except Orthoptera and many of the acridids were still immature. Most of the specimens taken were swept from *Salix* and meadow vegetation by a swift stream at a lower altitude (No. 2).

4. Keşap, 15 m., 16.iv.1959. Rhododendron patches in flower on waste ground above the village.

5. Şebinkarahisar, 8.vii.1960, (add 1,300 m.).

6. Giresun, Şebin Karahisar label should read as No. 5. Four different habitats but small Diptera, Homoptera and Odonata from edges of a large pond; Dolichopodids from a shady drinking fountain.

7. Yavuzkemal, 1,600 m., 16.v.1962. Meadows bordering conifer forest and along glades by a stream below the village.

GÜMÜŞANE [55]

1. Bayburt area, 20.vii.1960, 1,500 m.
2. Bayburt, 24.vii.1960, 1,500 m.
3. Bayburt, 26.v.1962, 1,600 m.

Nos. 1 and 2 refer to typical barren stony hillsides rising from plateau north of Bayburt and to one marshy meadow (mostly sawflies, *Dolerus*). No. 3 refers to the dry southern lower hill slopes rising to the Soğanlı Geçidi.

4. Erzincan–Köse Rd., 11.vii.1960, (add 1,200 m.). Rocky and eroded hillside near Köse.
5. Nr. Maden, 1,800 m., 29.v.1962. Sweeping *Salix* by swift flowing stream in gorge.
6. Soğanlı Geçidi, 2,000 m., 25.vii.1960.
7. Soğanlı Geçidi, 2,500 m., 25.vii.1960.
8. Soğanlı Geçidi, 2,450 m., 26.vii.1960.
9. Soğanlı Geçiđi, 1,800 m., 26.vii.1960.
10. Soğanlı Geçidi, 1,800 m., 27.v.1962.
11. Trabzon, Soğanlı Geçidi, 2,600 m., 27.v.1962. (The top of the pass appears to be on the borders of Trabzon and Gümüsane provinces).
12. Soğanlı Geçidi, 1,900 m., 28.v.1962.

That part of the coastal range of Pontic Mountains known as the Soğanlı Dağları which is linked with the Tatos Dağları further east is traversed by a high pass, the Soğanlî Geçidi (2,675 m.). The north facing slopes just below the pass consist of lush alpine meadows where ice and snow are still melting at the end of May and when the zigzag road leading down to Of on the Black Sea coast is frequently impassable and dangerous. These hillsides before they merge lower down with dense conifer forest are in places dotted with thick patches of *Vaccinium myrtillus*, a little Salix and the white *Rhododendron caucasicum* while *Primula auriculata* and *P. kuznetzowii* grow beside small bogs and streamlets. Some hillsides in May are more turfy and with colonies of a *Euphorbia* much visited by Tenthredinidae and other Hymenoptera. A feature at the edge of the melting ice is the very large number of Coleoptera, mostly Carabidae, that are seen crawling about during sunshine.

Looking north from just below the pass a great blanket of cloud is seen to stretch out two thousand feet below to the Black Sea, enveloping first the conifer forest and then mixed deciduous woods typical of the hinterland of the eastern part of the Black Sea Coast at about 1,000 metres. From Bayburt a huge mass of ominous cloud can often be seen hanging over the Pontic Ranges which limit the extent of its maximum precipitation. The southern slopes of the Soğanlı Dağları lack the typical lush alpine meadows of the northern side and consist in the area of the pass of turf expanses grazed by livestock. Here, below 2,000 metres, vegetation declines and the stony hillsides begin to show all the normal signs of erosion associated with overgrazing. Collecting at these lower altitudes was confined largely to umbellifer flowers and sweeping *Salix* by streams and the flora of small meadows in the valleys.

13. Varzan Geçidi, 1,800 m., 25.v.1962. Below a low pass (1,900 m.) on the main Gümüsane–Bayburt Rd. Collecting at umbellifers on stony hillsides and sweeping a marsh in a large depression (mainly Symphyta).

14. Zigana village, 1,200 m., 25.v.1962. The village is on the south side of the Zigana Pass. Sweeping spring flowers and *Ulmus* bushes in small cemetery.

HATAY [30]

1. Antakya, c. 100–150 m., 14.vi.1960.
2. Antakya, c. 300 m., 14.vi.1960.
3. Above Antakya, 15.vi.1960, 70–300 m.

Collected around the ruined castle high above Antakya and at various points on the road to Altınözü where there are patches of low *Quercus* scrub on some of the hills.

4. Dörtyol, 9.vi.1960, 50 m.
5. Nr. Hassa, 70 m., 16.vi.1960.
6. İskenderun, Sarıseki, 12.vi.1960, S.L. Large marsh with stream north of İskenderun.
7. Above İskenderun, 13.vi.1960, 80 m. Dry hillside with *Pinus*.
8. Kırıkhan–Hassa Rd., 16.vi.1960, 100 m. Eroded waste ground on a plain.

İÇEL [29] [= Mersin]

1. Alata, nr. Mersin, 28.v.1960, S.L.
2. Alata, 29.v.1960, S.L.
3. Alata nr. Mersin, 30.v.1960, S.L.

Coastal sandhills. *Allium* flowers swept in vegetable gardens on light soil. Gullies fringed with *Nerium* and *Myrtus* behind Ziraat Technical School. Warm damp climate.

4. Erdemli, 30.v & 1.vi.1960, (add " S.L. "). Extensive marsh with deep ponds with adjacent banana plantations and dykes fringed with long grass.
5. Gözne, 2–3.vi.1960, (add " 600 m. ").
6. Gözne, 2.vi.1960, 600 m.
7. Gözne, 3.vi.1960, 600 m.
8. Gözne, 4.vi.1960, 600 m.
9. Gözne, 5.vi.1960, 600 m.

Rocky broken terrain with alder-lined stream 34 km. N of Mersin.

10. Mersin, S.L., 20.vi.1960. Coastal sandhills.
11. above Mersin, 5.vi.1960, (add " c. 100 m. "). Dry chalk hillside with *Cistus*.
12. Amanus Mts., (correct to Içel) Sertavul Geçidi, 22.vi.1960, 1,600 m.
13. Mersin, Sertavul Geçidi, 22.vi.1960, 1,600 m.
14. Amanus Mts., (correct to Içel) Sertavul Geçidi, 21.vi.1960, 1,600 m.
15. Mersin, Sertavul Geçidi, 21.vi.1960, 1,600 m.

This pass occurs on the elevated treeless rim of the Anatolian plateau. Plentiful flowers between small cereal plots in a rocky broken area with hillocks of *Acantholimon* and *Astragalus*. Swarming with Orthoptera at end of June.

16. 16 mls. Mut–Silifke Rd., 21.vi.1960, c. 100 m. Thin *Pinus* forest.

İSTANBUL [4]

1. Alaçali, 100 m., 9.vii.1962. Scrub-covered hillsides on Sile Rd. NE of İstanbul.
2. Belgrat Orman, 8.v.1960, 30 m.
3. Belgrat Orman, (or Belgrad Ormani), 12.v.1960, 13.v.1960, 14.v.1960, 30 m.
4. Belgrat Orman, 25.iii.1962, 30 m.

In Thrace, an extensive deciduous forest mainly of *Fagus, Quercus* and *Carpinus* and within easy reach of İstanbul. It contains a lake with marshy areas and open expanses of *Calluna*. As a natural habitat it is beginning to suffer from human depredations although known as a forest reserve.

5. Istanbul, Ciftalan, 900 m., 26.v.1960. This label is wrong and should read Niğde Province, Çiftehan. See under NİĞDE.
6. Büyük Ada (Prinkipo), 20.ix.1959, S.L. The largest of the Iles des Princes. Typical Mediterranean scrub and pine woods on rocky terrain. Unproductive.
7. Büyükdere, 20 m., 18.ix.1959. *Myrtus* thickets, *Cistus* and *Calluna* on hillsides overlooking the Bosphorus.
8. Sile area, S.L., 10.vii.1962.
9. Sile area, S.L., 11.vii.1962.

Collected a few km. behind this village on the Black Sea by a valley stream bordered with dense vegetation and on hillsides covered with *Quercus* scrub.

10. Mt. W. of Yakacık Nr. İstanbul, 21.ix.1959 (add 100 m.). Hill covered with *Calluna* and *Arbutus* scrub and marshy patches in gullies on lower slopes (sweeping).

KARS [61]

1. İğdir (add, Erhacı Gölü), 30.viii.1960, 800 m.
2. Peyhanli, 800 m., 31.viii–10.ix.1960. (Correct to Reyhanlı). Refers to environs of Government Farm Headquarters.
3. İğdir, Peyhanli, 1.ix.1960, 1960, 800 m. (Omit " İğdir " and correct to Reyhanlı).
4. S.E. slopes of Ararat, 1.ix.1960, 800 m. (Correct S.E. to N.E.).
5. Little Ararat, 2.ix.1960, 3,000–3,600 m.
6. Kücük Ağri Dağı, Serdarbulak, 2,600–3,300 m., 2.ix.1960.
7. Ararat below Serdarbulak, 4.ix.1960, 1,700 m.
8. Ararat below Serdarbulak, 7.ix.1960, 1,700 m.
9. Ararat below Serdarbulak, 8.ix.1960, 1,700 m.
10. Ararat, below Serdarbulak 10.ix.1960, 1,700 m.
11. Ararat, Kara Su Spring, 28.viii.1960, 800 m.

Our visit to the Mount Ararat area was arranged jointly by the Ankara University and the Department of Agriculture who finally prevailed upon the Ministry of the Interior to let us go. We were fortunate to be accompanied by Mr. Huseyin Belet of the Plant Protection Institute at Samsun who acted as our mentor.

After the train journey from Ankara to Erzurum we arrived at Kars by local bus on 25th August and were checked by the Security officials. The next day we pushed on via Igdir to the Igdir Agricultural Experimental Farm at Reyhanli which is situated at the head of a narrow tongue of land between the Aras River marking the

frontier with Russia and the Karasu stream bordering with Iran. We made the Experimental Farm our headquarters and our kind Turkish hosts encouraged us to go wherever we wished until we left on 12th September.

Below the farm and between the two river boundaries a green grazing belt of lush vegetation extended to the east with swamps and dense beds of *Phragmites* fringing the permanent waterways. Areas of halophytes including *Suaeda, Tamarix, Limonium* and *Chenopodium* occurred in places.

Another type of habitat which extended from within a few yards of the Farm Headquarters westwards to the horizon was the plain at about 800 metres gently rising to the lowest lava slopes of Mount Ararat. This sandy plain reminded K.M.G. of desert areas in North Africa with its abundance of plants such as *Caligonum comosum, Tribulus terrestris, Aristida plumosa, Alhagi camelorum,* followed by extensive *Artemisia* steppe. This resemblance was also echoed in the reptile fauna and in the presence of a *Leptopternis* grasshopper new to Turkey.

Mount Ararat or Büyük Ağrı Dağı (5,165 m.), connected with Little Ararat or Kücük Ağrı Dağı (3,925 m.) by a saddle at 2,600 metres on which are the shepherd habitations of Serdarbulak, is seen from the north emerging from the plains as an isolated barren snow-topped cone mountain. A closer acquaintance with its scree, tumbled rocks and lava blocks reveals its geological youth. From the northern aspect the mountain appears treeless but some dark patches seen on Little Ararat proved to be pure birch forest (*Betula verrucosa*) with trees up to twenty feet in height and in September completely lacking in insects.

The altitudinal limits of our collecting took us to the top of Little Ararat, which proved barren and uninteresting except for the view and the prospect of seeing a bear. The jumble of huge rocks and the lack of vegetation on the neighbouring highest mountain of Turkey suggested a similar dearth of insects to that of Little Ararat. Entomologically speaking, Mount Ararat has been little explored but in early September except for a few Orthoptera we found very little of interest above 1,700 metres. The whole area is extremely rocky and there are no damp alpine meadows or streams so familiar on other Turkish mountains. At the time of our visit, the livestock that graze on the mountain had recently descended to the plains for lack of pasture and Serdarbulak only had one well at which the beasts were watered. However, at about 1,700 metres although the grass tufts had mostly yellowed, flowers were still plentiful and many hymenoptera were taken at the umbellifer *Echinophora trichophylla* and also by sweeping isolated *Ulmus* bushes in a rocky gully. When we left the area on 12th September, the symmit of the mountain had been covered by forbidding storm clouds for several days.

12. Yalnızçan Geçidi, 2,600 m., 14.ix.1960. (Correct this and 13. below to " Yalnızçam "). On the summit, short turf dotted with *Crocus valicola.* Cold and only a few Orthoptera.

13. Yalnızçan Geçidi, c. 1,800 m., 14.ix.1960. Hillside with dense vegetation opposite castle ruins.

KASTAMONU [25]

1. Kastamonu area, 18.vii.1962, 1,000 m. Sweeping *Salix*-filled marsh on hillside 10 km. W of Kastamonu.

2. Kastamonu area, 21.vii.1962, 1,000 m. Mostly Orthoptera from cornfield south of Kastamonu.

3. Seydiler area, 20.vii.1962, 1,000 m. Mostly Orthoptera from barren limestone ridge south of village and *Bombus* from *Ononis* flowers in field north of village.

KASTAMONU–ÇANKIRI [25/26]
BORDER

1. Ilgaz Dağı, 1,775 m., 19.vii.1962.
2. Ilgaz Dağı, 2,000 m., 19.vii.1962.
3. Ilgaz Dağı, 2,200 m., 19.vii.1962.
4. Ilgaz Dağı, 2,300 m., 19.vii.1962.
5. Ilgaz Dağı, 2,500 m., 19.vii.1962.
6. Ilgaz Dağı, 1,300 m., 21.vii.1962.
7. Ilgaz Dağı, 1,700 m., 22.vii.1962.

The Ilgaz Dağları is an extensive and isolated range running east–west and is separated from the main Pontic Mountains by the valley of the Kızılırmak. It contains Ilgaz Dağı (2,565 m.) which rises bare and solitary from a sea of conifer forest. On a fine day the flat top may best be reached by climbing the fairly gentle west shoulder after leaving the vehicle in a forest clearing at the end of a hazardous track. The last 700 metres of mountain is free from trees and generally with a good coverage of grass, tufted on light scree or turf near the top and with patches of flowers in July as focal points for insects. The alpine meadows and glades in the forest at lower altitudes (1,700 m.) are, however, full of insects especially near the south rim of the pass by the roadside. As a limit for the distribution of Caucasian or even European species this range might prove interesting.

KAYSERİ [34]

1. Erciyes Dağı, c. 1,800 m., 5.ix.1959.
2. Erciyes Dağı, c. 1,800 m., 14.vi.1962.

Erciyes Dağı is a mountain south of Kayseri of volcanic origin. Collecting area was stony with patches of heavily grazed turf. Some *Astragalus* in flower was attracting Bumble bees.

3. Sultanhanı, 1,200 m., 13.vi.1962.
4. Sultanhanı, 1,200 m., 15.vi.1962.

Collecting area about 50 km. from Kayseri on Sivas road. Actually 1 km. south of village of Sultanhanı. Plain of sand and gravel sloping to a distant salt lake. Much *Euphorbia* in flower.

KİRŞEHİR [36]

1. Kaman Area, c. 1,000 m., 17.vi.1962. Mostly Diptera from damp ditch by road running over typical cultivated plateau.

KONYA [28]

1. Nr. Beyşehir, Yeniköy, c. 1,850 m., 3.x.1960.

2. Karaman, 22.vi.1960, (add " 1,600 m. "). Refers to Sertuval Geçidi, see under İÇEL.

3. Konya Area, c. 1,000 m., 23.vi.1960. Salt flats with hillocks of *Limonium* 20 km. S of Konya.

KÜTAHYA [11]

1. Acem Dağ, 1,700 m., 28.vii.1962.

2. Acem Dağ, 1,300 m., 28.vii.1962.

(1) Refers to overgrazed hillsides with stunted *Juniperus* near the summit of this mountain behind Kütahya. (2) Refers to the lower part of the mountain and not differing from typical plateau ; Hymenoptera roosting on corn at dusk.

3. Akçakertik, 1,400 m., 1.viii.1962. NE of Demirci, sweeping flowering *Mentha* in dried up depression in conifer woods.

4. Çavdarhisar, 900 m., 29.vii.1962. A small undisturbed cemetery with long grass and flowers.

5. Domaniç, 1,000 m., 25.iv.1962. Sweeping *Euphorbia* on cultivated plateau.

6. Gediz, 824 m., 29.vii.1962.

7. Near Gediz, 800 m., 1.vii.1962.

8. Kütahya, 984 m., 27.vii.1962. (Correct to " Kaymaz, c. 1,000 m. "). Sweeping white umbellifers by roadside on typical plateau.

9. Murat Dağı, 1,500 m., 30.vii.1962.

10. Murat Dağı, 1,700 m., 31.vii.1962.

11. Murat Dağı, 1,200 m., 31.vii.1962.

Murat Dağı lies SE of Gediz. Its top (2,224 m.) consists of turfy downland reached by ascending through conifer forest. 9 refers to wet alpine meadows in the forest at Kesik Sögüt. 10 refers to one of the summits of the mountain, an overgrazed expanse of downland. 11 refers to unproductive *Pinus* woods at lower elevations. Murat Dağı is typical of many Turkish mountains where the best insect collecting is to be had in lush forest glades and patches of alpine meadow in the zones of intermediate altitude at about 1,500 metres.

12. Simuv (correct to " Simav "), 800 m., 1.viii.1962. Sweeping yellow umbellifers in cemetery on outskirts of town.

MANİSA [13]

1. Nr. Gördes, 2.viii.1962, (add " c. 500 m. "). Overgrazed waste land with stunted *Quercus*.

MARAŞ [33]

1. Maraş, 11.vi.1960, 700 m. (Correct to " 17.vi.1960 ").

2. Maraş, 17.vi.1960, 700 m.

3. Maraş, c. 1,200 m., 17.vi.1960.

Refers to slopes of part of the mountain behind the town with tussocks of *Acantholimon* above a zone of grass tufts with patches of *Quercus* scrub.

4. Maraş, 300–700 m., 17.v (correct to vi).1960.

5. Maraş–Gaziantep Rd., c. 100 m., 18.vi.1960.

MERSİN see İÇEL [29]

MUĞLA [16]

1. 1,800 m., Göktepe, 21.iv.1962. From the village of Kavaklîdere (not to be confused with the Ankara suburb) this mountain can be approached by a dangerous forest track normally used later in the year by forestry vehicles. An open *Pinus* forest ascends to within 1,500 metres of the summit but there were turf glades covered with small spring flowers. Snow lay thick on much of the summit but Hymenoptera were visiting *Crocus* and *Scilla* and Asilidae were out near the snow.

2. S.L., Fethiye, 14.iv.1962. Mostly sweeping marsh and beds of *Iris pseudacorus*. Coleoptera from a dry gravel plain.

3. 40 km. Fethiye–Ortaca Rd., 15.iv.1962, 200 m. Sweeping marsh and damp meadow.

4. 150 m., Kestep, 12.iv.1962. Diptera from dry stream bed in overgrazed valley.

5. S.L., Nr. Köyceğiz, 16.iv.1962. Sweeping marshy places.

6. 200 m., Marmaris, 18.iv.1962. (only *Bombus* at 200 m., rest S.L.).

7. S.L., Marmaris, 19.iv.1962. Marshy meadows on town outskirts and cemetery and scrub and flower covered isolated hill.

8. 100 m., Marmaris–Ula Rd. (correct to " Marmaris–Muğla Rd. "), 20.iv.1962.

9. 600 m., Muğla Area, 20.iv.1962.

10. 700 m., Ula (Mezarlik), 17.iv.1962. Cemetery filled with spring flowers.

NİĞDE [35]

1. 30 km. S. of Aksaray, c. 1,000 m., 25.v.1960. Rocky terrain on lowest slopes of Melendiz Dağı.

2. Aksaray Area, 900 m., 24.vi.1962. A stony plain.

3. Altınhisar, 100 m., 24.vi.1962. Saline area with much *Chenopodium*, *Suaeda* and *Limonium*.

4. Çiftehan, 1,000 m., 23.vi.1962. See also under İSTANBUL, 5. By the roadside between Ulukişla and Çiftehan. Rocky hillsides and gullies with *Euphorbia* and *Ulmus* bushes.

5. Kocaş (D.U.Ç.) 900 m., 24.vi.1962. The Agricultural School Farm (Devlet Uretme Çiftlik). Collected on the plain bordering south Tuz Gölü in marshy zone subject to drainage.

6. 25 km. Ulukisla–Aksaray (add " Rd. "), 25.v.1960, 1,000 m. Extensive grazing plain partly saline. Hymenoptera at blue Iris flowers.

ORDU [44]

1. Ordu, 14.iv.1959, c. 100 m. Hazel nut plantations in hills behind Ordu.

2. Ünye, 8.iv.1959, 30 m. Hazel nut plantations near sea. Diptera swept from coastal marsh filled with *Leucojum* 2 km. E of Unye.

RİZE [57]

1. Çayeli, 15 m., 22.viii.1959. *Alnus* plantations near flowing stream.

2. Cinciva, 500 m., 24.iv.1959. (correct to Cinciova). Mixed forest with lush glades. Marshy meadows with spring flowers and *Equisetum*.

3. Fındıklı, 4.vi.1962, (add " near S.L. "). Sheltered damp hazel plantations near *Alnus*-lined stream.

4. İkizdere, 600 m., 19.viii.1959. Lush meadow by valley stream.

5. Rize at S.L., 22.iv.1959, (near Of).

6. Rize, S.L., 21.viii.1959.

Along sheltered *Alnus*-lined stream in valley with tea plantations.

7. Sivrikaya, 4,000′ (correct to " 1,700 m. "), 20.viii.1959.

8. Sivrikaya, 3.vi.1962, 1,700 m.

Damp meadows along valley on road Rize–Ispir. At this altitude in the Pontic mountains it is only late spring and the great majority of butterflies do not appear until the end of August.

SAMSUN [42]

1. Bafra, 5.v.1959 and 7.v.1959, 30 m. Refers to a few hectares of unspoilt *Quercus* woodland named Büzmelek between Engiz and Bafra.

2. Çakallı, 400 m., (Samsun–Kavak Rd.), 16.v.1959. Grazing land with patches of *Quercus* scrub.

3. Çakıralan, 27.vii.1959, c. 3,800′ (correct to " 22.vii.1959, 800 m. "). Havza area, isolated hill with *Quercus* scrub.

4. Çarşamba, 7.iv.1959, (add " S.L. "). Apple orchard with spring flowers.

5. Engiz, 30 m., 9.v.1959.

6. Engiz, 30 m., 10.v.1959.

7. Engiz, 17.v.1959, (add " S.L. ").

8. Engiz, 26.v.1959, (add " S.L. ").

9. Engiz, 27.v.1959, (add " S.L. ").

10. Engiz, S.L., 11–12.vi.1959.

11. Engiz, 22.ix.60, S.L.

Engiz refers to various points near the Samsun–Bafra Rd. within 25 km. of Samsun. There are swampy woods and dense low forested hillsides largely of *Quercus* with an interesting flora. The shore is sandy with a few brackish ponds. North of Engiz there are extensive lakes and marshes. The enclosed area of low forest, the habitat of pheasants, just beyond Engiz, was frequently visited.

12. Geleman (Nr. Samsun), 7.iv.1959, (add " S.L. ").

13. Geleman, 7–9.vi.1959, (correct to " 7–9.iv.1959 ").

14. Geleman, 8–9.iv.1959, (add " S.L. ").

15. Geleman, 10–11.iv.1959, (add " S.L. ").

16. Geleman, (Nr. Samsun), 4.v.1959, (add " S.L. ").

Agricultural Farm on the coastal plain east of Samsun. Reclaimed by drainage but one swampy *Fraxinus* wood and stagnant canals.

17. Kavak–Samsun Rd., 12.v.1962, 800 m. *Fagus* and *Quercus* scrub with *Rhododendron flavum*.

18. Köprübaşi nr. Havza, 1,000 m., 24.vii.1959. Irrigation channel bordered with lush vegetation and *Salix*.

19. Kunduz Ovacik, 1,300 m., 22.vii.1959. A western extension of Tavsan Dağı. Glades of grazed turf in conifer forest and a lush meadow near stream.

20. Lâdik Lake, 800 m., 26.vii.1959.

21. Samsun, S.L., 6.v.1959. (= Engiz).

22. Samsun, 21.v.1959. This label is wrong. Substitute " North Turkey ".

23. Samsun, 28.v.1959, (add " S.L. "). Between gardens, western outskirts of town.

24. Samsun Area, 2.viii.1959, 0–30 m. (= Engiz).

24a. Samsun, 3.viii.1959.

25. Samsun Area, 14.v.1962, (add " S.L. ") (= Geleman).

26. 18 km. E of Samsun, 3.iv.1959. This label is wrong. Substitute " TURKEY, 1959 ".

27. 18 km. S.E. of Samsun (correct to " west of Samsun "), 3.v.1959, 0 ! (=Engiz).

28. Samsun–Bafra Rd., 11.v.1959, (add " S.L. ") (= Engiz).

29. Terme, 15.v.1962, (add " S.L. "). Sandy waste ground near shore.

30. Havsa, 500 m., 19.v.1959. Stony sides of valley near town, with some *Quercus* scrub.

31. Vezirköprü, 23.vii.1959, (add " c. 700 m. "). Hymenoptera swarming on white umbellifers beside road near cereal fields.

SİNOP [41]

1. Bektesaga, Sorikum, 16.vi.1959, S.L. Large *Fagus* forest west of Sinop. Unproductive.

2. Hassan, 800 m., (45 km. S.E. of Sinop(e)), 19.vi.1959. *Abies* forest with undergrowth of *Rhododendron flavum*.

3. Sinop(e), 15 m., 14.vi.1959.

4. Sinop(e), 18.vi.1959, (add " S.L. ").

Sinop already marks the drier western part of the Black Sea Coast. Most of the collecting was done on the dry peninsula jutting beyond the town. Sand dunes adjoining the Department of Agriculture buildings near the sea were good for Hymenoptera.

SİVAS [46]

1. Devre (Nr. Sivas), 1,350 m., 12.vi.1962. Sweeping extensive marsh.

2. Koyulhisar, 30.vii.1960, 1,700 m. Marsh in grazing depression.

3. Şerefiye area, 4.vii.1960, 1,700 m. Collecting along *Salix*-lined stream along small valley. Many Tabanids flying round the Land Rover on the road.

4. Şerefiye area, 4.vii.1960, 1,850 m. Refers to the Karabayır Pass through treeless stony hillsides with some turf.

5. Şerefiye–Karabayır Area, 1,300–2,000 m., (add " 7.vii.1960 "). Refers to both 3 and 4.

6. Şerefiye area, 17 (correct to " 7 "), vii.1960, 1,500 m.

7. Şerefiye, 1,700 m., 12.vi.1962. Large pasture depression in the hills.

8. Sivas, 3.vii.1960, 1,200 m.

9. Nr. Sivas, 3.vii.1960, 1,300 m.
10. Nr. Susehri, 1,300 m., 12.vi.1962.
11. Zara Lake, 5.vii.1960, (add " C. 1,000 m. ").
12. Zara Area, c. 1,150 m., 5.vii.1960.

This blue lake with a marsh and slow meandering stream at the eastern end lies in a wide depression in the typical bare hills of the plateau.

TEKİRDAĞ [3]

1. Halıköy (nr. Malkara), 7.vii.1962, 200 m. This is almost the same locality as EDİRNE 2.
2. 24 km. Malkara–İnecik Rd., 8.vii.1962, 150 m.
3. 24 km. Malkara–İnecik Rd., 12.viii.1962, 150 m. Stream bordered by dense vegetation in cultivated valley.

TOKAT [43]

1. Arguslu above Niksar, 700 m., 28.vii.1959. Arguslu Ketenderesi, *Alnus*-lined stream and conifer woods.
2. Lâdik area, 31.vii.1960, 600 m.
3. Niksar, 300 m., 29.vii.1959. Mostly from extensive marsh in valley of Yeşilırmak.
4. Ni(c)ksar area, 31.vii.1960, (add " c. 300 m. "). Sweeping white umbellifers by roadside.

TRABZON [56]

1. Boztepe, 50 m., 18.v.1962. Relict patches of mixed conifer and deciduous woodland with adjacent areas of *Calluna* and *Cistus*.
2. Hamsiköy, 1,700 m., 15.viii.1959. Timber yard in Hamsikoy village which is en route to Zigana.
3. Hamsiköy, 1,245 m., 23.v.1962.
4. Hamsiköy, 1,245 m., 24.v.1962.

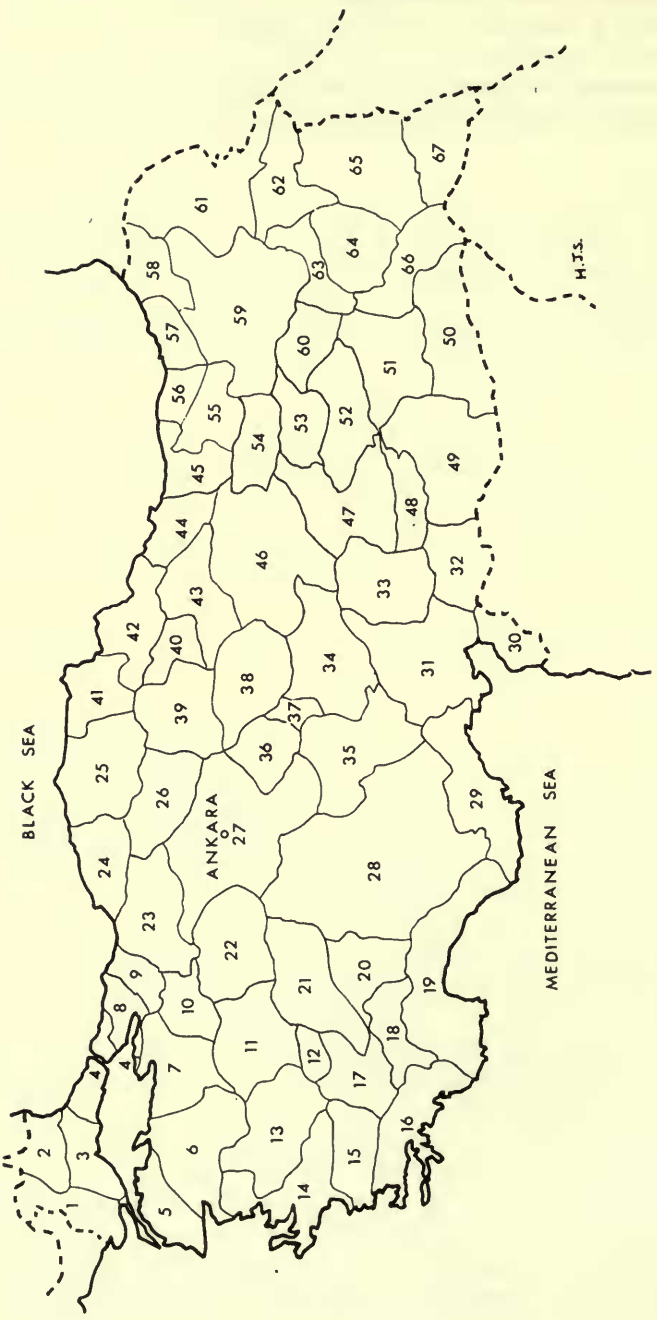
Flower filled meadows and glades by alder-lined stream below the village.

5. Maçka–Sumela (monastery) Rd., 1,000 m., 19.v.1962.
6. Sürmene, 18.vii.1960, S.L. Sandy coastal area.
7. Trabzon Area, 19.iv.1959, (add " S.L. ").
8. Trabzon, 16.viii.1959, (add " S.L. ").
9. Trabzon, 24.viii.1959, S.L.
10. Trabzon, 50 m., 28.vii.1960. (= Boztepe).
11. Trabzon area, 28.vii.1960, (add " S.L. ").

Collecting at Trabzon was confined to (1) an *Equisetum* marsh by a stream in a small field on the eastern outskirts of the town, No. 7; (2) sweeping flowers in marshy places along the river bed east of the town, Nos. 8, 9 and 11.

12. Vakfikebir, 29.vii.1960, S.L. Along shady alder-lined stream on Trabzon–Giresun Rd.
13. Zigana Dağı, 1,700 m., 10.vii.1959.

[*Continued on p.* 250


BLACK SEA
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MAP KEY TO TURKISH PROVINCES

1. Edirne
2. Kırklareli
3. Tekirdağ
4. İstanbul
5. Çanakkale
6. Balıkesir
7. Bursa
8. Kocaeli
9. Sakarya
10. Bilecik
11. Kütahya
12. Uşak
13. Manisa
14. İzmir
15. Aydın
16. Muğla
17. Denizli
18. Burdur
19. Antalya
20. İsparta
21. Afyon
22. Eskişehir
23. Bolu
24. Zonguldak
25. Kastamonu
26. Çankırı
27. Ankara
28. Konya
29. İçel
30. Hatay
31. Adana
32. Gaziantep
33. Maraş
34. Kayseri
35. Niğde
36. Kirşehir
37. Nevşehir
38. Yozgat
39. Çorum
40. Amasya
41. Sinop
42. Samsun
43. Tokat
44. Ordu
45. Giresun
46. Sivas
47. Malatya
48. Adıyaman
49. Urfa
50. Mardin
51. Diyarbakır
52. Elaziğ
53. Tunceli
54. Erzincan
55. Gümüşane
56. Trabzon
57. Rize
58. Artvin
59. Erzurum
60. Bingöl
61. Kars
62. Ağri
63. Muş
64. Bitlis
65. Van
66. Siirt
67. Hakkâri

14. Zigana Dağı, 1,700–2,000 m., 10–14.viii.1959.
15. Zigana Dağı, 13.vii.1960, 1,400 m.
16. Zigana Dağı, 14.vii.1960, 1,400 m.
17. Zigana Geçidi, 1,650 m., 22.v.1962.
18. Zigana Dağı, 2,300 m., 22.v.1962.

The neighbourhood of the main road from Trabzon to Gümüsane and between the village of Hamsikoy and the pass over Zigana Dağı is one of the best if not the best collecting station near the Black Sea Coast. This could be due to the easy accessibility of collecting localities at various altitudes between about 1,400 metres and 2,000 metres not excepting the verges of the road itself. Though subject to heavy rainfall there are few days when some collecting is not possible (even at the windows of the village restaurant which harbour a varied fauna). The choicest areas for insects occur at about 1,700 m. in forest glades and in clearings full of flowers beside rushing streams in July and August. Above the *Abies* forest which in places extends up to nearly 2,000 m., the Zigana appears as gently rolling turf downland which in late May is dotted with *Viola* and *Gentiana* while beside the melting snows, *Scilla*, *Colchicum* and *Cyclamen* are just beginning to flower. Between the turf downland and the forest there is a meadow zone, in May dotted with *Primula macrocalyx*. The meadows are cut for hay at the height of the flowering season in mid-August when Orthoptera abound in this zone as well as on the downland. With the exception of butterflies and bumble bees (*Bombus*) and possibly Coleoptera, there are few insects above the 2,000 m. level. In 1959 a visit to Hamsikoy on 18th April proved to be too early for insect collecting and snow was still lying above the village.

UŞAK [12]

1. 1,000 m., Sivaslı, 24.iv.1962. Sweeping *Quercus* trees and *Euphorbia* on a plateau plain.

YOZGAT [38]

1. Yozgat–Sivas Rd., 1.vii.1960, 1,000 m.
2. Yozgat–Yıldızeli (add " Rd. "), c. 1,300 m., 1.vii.1960. Eroded hillsides with flowers.

ZONGULDAK [24]

1. Nr. Safron Bolu, 17.vii.1962, 700 m. (Correct to " Safranbolu "). Mixed forest on edge of escarpment 13 km. N of Safranbolu. Orthoptera from stony hill on eroded plateau.
2. Nr. Safran Bolu, 18.vii.1962, 450 m. (Correct to " Safranbolu ").
3. Nr. Urus, 17.vii.1962, 100 m.